CLAIMS

1. An air intake system for an internal combustion engine comprising:

an intake passageway;

a charger in-line with said intake passageway;

a cooler disposed in-line with said intake passage and located downstream of said charger;

a bypass passage coupled between a portion of said intake passage upstream of said cooler and a portion of said intake passage located downstream of said cooler so as to allow a flow of air discharged from said charger to bypass said cooler;

a bypass control valve disposed in said bypass passage and adapted to open and close said bypass passage; and

flow restriction disposed in said bypass passage, said flow restriction limiting flow through said bypass passage in the event that said bypass control valve remains in an open position.

2. An air intake system according to claim 1, in which said flow restriction comprises a flow restriction orifice dimensioned such that flow is unimpeded until a predetermined critical flow rate is achieved.

3. A charge air cooler comprising:

a cooling passage;

a bypass passage;

a bypass control valve disposed in said bypass passage and adapted to open and close said bypass passage; and

a flow restriction disposed in said bypass passage, said flow restriction limiting flow in the event that said bypass control valve remains in an open position.

4. A charge air cooler according to claim 3 wherein said flow restriction comprises portions defining a flow restriction orifice dimensioned such that flow is unimpeded until a predetermined critical flow rate is achieved.

5. A charge air cooler according to claim 4 wherein said flow restriction is a venturi.

6. A method of cooling charge air using a cooler having a cooling passage and a bypass passage comprising the steps of:

operating a bypass control valve such that the cooling passage is bypassed under particular engine operating conditions; and in which in the event of failure of the bypass control valve, limiting flow through the bypass passage at a predetermined critical flow rate.

7. A method of cooling charge air cooler according to claim 6 further comprising the step of operating a bypass control valve in response to the temperature of air emitted from a charger located upstream of the cooler.